

## INTERNATIONAL SEARCH REPORT

International Application No

/EP2004/050989

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H01L21/312

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01L C08G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>HUANG Q R ET AL: "Structure and interaction of organic/inorganic hybrid nanocomposites for microelectronic applications. 1. MSSQ/P(MMA-co-DMAEMA) nanocomposites"</p> <p>CHEMISTRY OF MATERIALS AMERICAN CHEM. SOC USA, vol. 14, no. 9, 9 September 2002 (2002-09-09), pages 3676-3685, XP002300511</p> <p>ISSN: 0897-4756</p> <p>published on the web 08/13/2002</p> <p>the whole document</p>	1-3,9-12
Y	<p>US 4 349 609 A (NAKAJIMA MINORU ET AL)</p> <p>14 September 1982 (1982-09-14)</p> <p>example 3</p>	1,2,5,6,9-12
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

13 October 2004

Date of mailing of the international search report

27/10/2004

Name and mailing address of the ISA

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PAN Q ET AL: "Spin-on-glass thin films prepared from a novel polysilsesquioxane by thermal and ultraviolet-irradiation methods" THIN SOLID FILMS, ELSEVIER-SEQUOIA S.A. LAUSANNE, CH, vol. 345, no. 2, 21 May 1999 (1999-05-21), pages 244-254, XP004177536 ISSN: 0040-6090 page 245, column 1, line 29 - line 43	1,2,5,6, 9-12
X	US 5 152 834 A (ALLMAN DERRYL D J) 6 October 1992 (1992-10-06) column 1, line 54 - line 62 column 3, line 62 - line 64 column 5, line 51 column 8, line 32 - line 33 column 8, line 47 - line 51	1,2,5, 9-11
X	EP 1 003 210 A (DOW CORNING) 24 May 2000 (2000-05-24) paragraphs '0017!', '0018!', '0040!', '0045!'	1,2,5,7, 10-12
X	EP 1 197 998 A (SHIPLEY CO LLC) 17 April 2002 (2002-04-17) paragraphs '0029!', '0030!; example 2; table 1	1,2,9-11
Y	US 6 015 457 A (LEUNG ROGER Y ET AL) 18 January 2000 (2000-01-18) abstract	1,2,11
Y	PROVATAS A ET AL: "Silsesquioxanes: Synthesis and Applications" TRENDS IN POLYMER SCIENCE, ELSEVIER SCIENCE PUBLISHERS B.V. AMSTERDAM, NL, vol. 5, no. 10, 1 October 1997 (1997-10-01), pages 327-332, XP004092049 ISSN: 0966-4793 figure 1c	1,2,11
A	MANTZ R A ET AL: "THERMOLYSIS OF POLYHEDRAL OLIGOMERIC SILSESQUIOXANE (POSS) MACROMERS AND POSS-SILOXANE COPOLYMERS" CHEMISTRY OF MATERIALS, AMERICAN CHEMICAL SOCIETY, WASHINGTON, US, vol. 8, 13 June 1996 (1996-06-13), pages 1250-1259, XP001038446 ISSN: 0897-4756 page 1252, column 1; figure 2	

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>EP 1 271 634 A (BOC GROUP INC)  2 January 2003 (2003-01-02)  abstract  paragraph '0011!</p>	

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP2004/050989

## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: -

Present claims 1 and 2 relate to an extremely large number of possible compounds and methods. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the compounds and methods claimed. Any process for producing low-k dielectric films from silsesquioxanes will at some time comprise the compounds of claims 1 or 2. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely the compounds of claim 4 and the example given on pages 9 - 11 of the description of the present application.

Present claim 12 relates to a film defined (inter alia) by reference to the its dielectric constant at a frequency of 880 kHz. The use of this specific frequency in the present context is considered to lead to a lack of clarity within the meaning of Article 6 PCT. It is impossible to compare the parameters the applicant has chosen to employ with what is set out in the prior art. The lack of clarity is such as to render a meaningful complete search impossible. Consequently, the search has been restricted to low-k dielectrics formed from the precursors of claim 4 or the example in the description of the present applicaiton.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

/EP2004/050989

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4349609	A	14-09-1982	JP 1349524 C	28-11-1986
			JP 56100447 A	12-08-1981
			JP 61013382 B	12-04-1986
			JP 1322606 C	11-06-1986
			JP 56049540 A	06-05-1981
			JP 60046826 B	18-10-1985
			JP 1507383 C	26-07-1989
			JP 56093766 A	29-07-1981
			JP 63046576 B	16-09-1988
			DE 3065150 D1	10-11-1983
			EP 0021818 A1	07-01-1981
US 5152834	A	06-10-1992	US 5302198 A	12-04-1994
			JP 2999603 B2	17-01-2000
			JP 5027444 A	05-02-1993
			US 5472488 A	05-12-1995
			US 5527872 A	18-06-1996
			US 5665845 A	09-09-1997
			US 5100503 A	31-03-1992
EP 1003210	A	24-05-2000	US 6231989 B1	15-05-2001
			EP 1003210 A2	24-05-2000
			JP 2000164589 A	16-06-2000
			KR 2000047675 A	25-07-2000
			SG 87856 A1	16-04-2002
			TW 505684 B	11-10-2002
EP 1197998	A	17-04-2002	EP 1197998 A2	17-04-2002
			JP 2002284997 A	03-10-2002
			US 2002198269 A1	26-12-2002
			US 2003022953 A1	30-01-2003
			US 2002065331 A1	30-05-2002
US 6015457	A	18-01-2000	TW 419493 B	21-01-2001
			WO 9847943 A1	29-10-1998
EP 1271634	A	02-01-2003	US 2002192980 A1	19-12-2002
			EP 1271634 A2	02-01-2003
			JP 2003045870 A	14-02-2003
			TW 548783 B	21-08-2003